Rana University
Faculty of Computer science
BIT Department

Course Title	**Data communication**
Lecturer Name	**Abdul Ghafar Omerkhel**
Credit Hours	**4**
Lecture Days	**From Saturday to Wednesday**
Lecture Timing	**Four different shifts**
Class No.	**603**

Course Description

This course focuses on the fundamentals of data communication and computer network. One goal is to give some insight into the rationale of why networks are structured the way they are today and to understand the issues facing the designers of next-generation data networks.
Much of the course focuses on network algorithms and their performance. Students are expected to have a strong mathematical background and an understanding of probability theory.

Course Objective

The main objective of the course is to equip the students with the knowledge of theoretical Data communication and computer networking. The whole concept of OSI model, IPv4, transmission media, network types and categories, types of network topology and Network devices are included. By the end of this course, Students will also have the knowledge of digital and analog signals and the way the digital data is represented by digital signal using many different encoding methods.

Teaching Method

The Operating System course is full theoretical, the lectures will be taken using the Slides, work document handouts and reference books. Some real life and figure example will be included to make the students understand the main concept. Additionally, two quiz exam, two assignments and a presentation are also considered to be held during the course.

Learning Outcome

Course Plan

Weeks	Chapters	Teaching Method	Remarks
1	**Introduction** Network and its Advantages Network communications	Theory	Assisting the students upon the suggested book
2	Basic Concepts Cabling, types	Theory & practical	**Homework**
3	**Topologies** Star bus with advantages and disadvantages	Theory	**Homework**
4	Mesh, Ring with advantages and disadvantages	Theory	**Homework**
5	**Transmission modes** **Components of a network model** centralized system distributed system	Theory	**Homework**
6	**Categories of Networks** Key Terms & Concepts	Theory	**Homework**
7	Local Area Network (LAN) Wide Area Network (WAN)	Theory & practical	**Homework**
8	- **Periodic and non-periodic signals** Fourier Transmission Sine Waves and its characteristics	Theory	**Homework**
Mid Term Exam (20%)			
10	Amplitude, phase and period/Frequency Digital Signals Bit rate and bit interval	Theory	**Homework**
11	SyQuest and Shannon Formulas Examples What is line coding? Characteristics of line coding	Theory	**Homework**
12	Pulse rate versus bit Rate DC components Self-Synchronization	Theory	**Homework**
13	Unipolar Line Coding Scheme Polar Line Coding Scheme NRZ, RZ, Manchester and differential Manchester Examples	Theory	**Homework**
14	Bi-Polar Line Coding Scheme AMI, B8ZS etc. Examples	Theory	**Homework**
15	**Seminars** **Quiz** **Revision**	Theory	
16	Final Term Exam		**In accordance with exam schedule**

Reference	1. Data & Computer Communication by Behrouz 2. Communication Networks by Leon Garcia &Widjaja

Class Discipline

Assessment Method

Exam Method